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Ny-Ålesund Newsletter

35th Edition – March 2015

Towards one coordinated Monitoring Programme for Ny-Ålesund

By Christina A. Pedersen, Norwegian Polar Institute

In January 2015, a workshop was arranged in Tromsø, Norway, to take the first steps towards implementing ***one*** coordinated, multi-disciplinary Monitoring Programme for Ny-Ålesund.

The NySMAC endorsed Ny-Ålesund Science Plan states that Ny-Ålesund shall be developed as a premier international Arctic research and monitoring facility. Ny-Ålesund is already an established refe-rence site for atmospheric, glacial, marine and terre-strial studies and hosts numerous, international, multidisciplinary collaborative science projects as it represents an ideal natural laboratory in the Arctic. With its long-term data series operated by the various stations and institutes, Ny-Ålesund represents one of the most important environmental monitoring sites in the Arctic. It is our vision to develop Ny-Ålesund's Monitoring Programme further within an Earth System Science approach to be able to address more complex scientific questions.

The workshop, funded by Svalbard Science Forum (Research Council of Norway), brought together 30 representatives from the four flagship programmes for Ny-Ålesund (marine biology, terrestrial ecology, glaciology and atmospheric science) and scientists from most of the stations to discuss and take the first steps towards implementing one common Monitoring Programme. The individual Flagship Programmes have previously identified important knowledge gaps, key areas for cross-disciplinary research activity and needs for new research infrastructure. This workshop now identified the basic *scientific parameters* of the Programme, which will form the basic also for the research performed in the Flagships. The workshop's working groups also discussed the key scientific questions to be asked for in the future, and assessed if the current ongoing monitoring will enable us to answer these questions.

– We aim at setting up an international and well co-ordinated Monitoring Programme for Ny-Ålesund, that will enable us to study advanced scientific problems. The first step is to make already existing monitoring measurements known and available from one common entry point, and to establish a working group that can establish the frame for this programme, elaborates scientific coordinator Christina A. Pedersen at the Norwegian Polar Institute.

The outcome of the workshop will be summarized in a report.

WORKSHOP: *30 researchers were gathered in Tromsø in January 2015 to discuss the way forward towards one common Monitoring Programme for Ny-Ålesund. Photo: Elin Vinje Jenssen/Norwegian Polar Institute*

Upcoming Events

By Christina Alsvik Pedersen, Norwegian Polar Institute

A full week with research focus on Ny-Ålesund:

Norwegian Polar Institute will host the 43rd NySMAC meeting, the 12th Ny-Ålesund seminar as well as the Ny-Ålesund Atmosphere Symposium at the Fram Centre in Tromsø during one week at end of September 2015 (tentatively 21-25 September 2015).

Svalbard Science Forum recently funded two other workshops with Ny-Ålesund and Svalbard as focus.

First, a workshop on "Past sedimentary environments in the Kongsfjorden system: atmosphere – ocean – glacier linkages". The workshop aims at identifying and coordinating future scientific research on past marine sedimentary environments in the Kongsfjorden system.

The current state of knowledge on the last glacial-interglacial cycle in the Kongsfjorden system will also be reviewed. The workshop is organized by the Norwegian Polar Institute and will take place at the Fram Centre in Tromsø in September/-October.

A second workshop, "Taking the next step in Svalbard snow research" will gather researchers working directly or indirectly with snow on Svalbard from the physical, chemical and biological point of view. The workshop aims at creating a network of scientists that couples the geo-, bio-, and cryo-cycles in the snow-covered environment of Svalbard, and also to establish links between the Ny-Ålesund flagship-programs on glaciology, atmosphere, terrestrial and marine systems. The workshop will tentative be organized in Poland in September 2015.

News from Svalbard Science Forum (SSF).

By Karoline Bælum, Svalbard Science Forum

Funding allocations from:

The Arctic Field grant received 81 applications for fieldwork in 2015. 44 projects were completely or partly funded to a sum of 2,07 mill NOK giving a 54% success rate! This year the majority of the applications were very good, so it was not an easy task to distribute the funds. The competition was hard.
Like previous years, about half the projects are located in Ny-Ålesund. Half of the funded projects are master projects while the other half is divided evenly between PhD and research projects.

The Svalbard strategic Grant handed out 2,26 mill NOK to 3 projects and 5 workshops for 2015. All the funded projects and workshops involve Ny Ålesund, and most of them include existing or new flagships.

To mention some:

- *Remote Controlled and Autonomous Measurement Platforms Flagship* (NORUT).
- *Workshop: Interdisciplinary Polar Studies in Svalbard* (UNIS).
- *Workshop on Past marine sedimentary environments in the Kongsfjorden system, Svalbard: Atmosphere, Ocean and Glacier linkages* (NPI).
- *Ocean Flagship* (Nansen Centre), *Terrestrial radar interferometry for monitoring tidewater glaciers in Ny-Ålesund and Hornsund* (NORUT).
- *Ny-Ålesund Atmosphere Research Symposium* (NPI).

The research in Svalbard database (RiS) is under continuing development and improvement, and new features and upgrades are added continuously. The booking and applications modules are the main priority for the next months. If you have suggestions, comments or find bugs, please contact us as we depend on your feedback to make RiS better.

SSF will participate in the next NySMAC meeting in Toyama and be present at ASSW2015.

You are always more than welcome to come by our office in Longyearbyen!

For more info please see the news items on www.svalbardscienceforum.no.

News from Kings Bay AS

By Sébasten Barrault, Aasne Dolve Meyer, Kings Bay AS and Paul Wenzel Geissler

Busy year

Increased research activity has resulted in more than 14.500 researcher days in Ny-Ålesund during 2014. This is an increase of 1.600 from the previous year, and Norwegian scientists account for approximately a third of the rise.

Research projects in Ny-Ålesund are conducted throughout the year to a larger extent than earlier, using Kings Bay infrastructure also during the low season. As an example, the Marine Night project, conducted by UiT, NTNU, Akaplan-niva and UNIS, has studied for the second consecutive year sea activity in polar nights. Led by professor Jørgen Berge, around 70 students and researchers found that sea life continues unabated, although most of the light is gone.

In January 2014 and 2015, Kings Bay has darkened the entire harbour and area around the Marine Lab, in order to accommodate and facilitate the research planned through these campaigns. According to the Marine Nigjht project leaders, it has been important to leave the study area in darkness for the entire campaign and it is only through the unique location and infrastructure available in Ny-Ålesund that this is feasible. Ny-Ålesund might therefore be considered the true home and cradle of dark Arctic research.

A Home for Science – social anthropology in Ny-Ålesund

As part of his fieldwork for the anthropological pilot project 'A Home for Science', Paul Wenzel Geissler visited Ny-Ålesund for two weeks each in June 2014 and in February 2015.

During the first field visit he followed ornithologists Geir Wing Gabrielsen and Maarten Loonen, and their co-workers during their scientific fieldwork, focusing on the project's first theme: 'different ways of understanding, valuing and engaging nature in fieldwork', and the role of scientific researchers' relation to the field, and to each other, in shaping scientific questions, work and findings.

During the second visit, Paul Wenzel Geissler focused on everyday life in the scientific station during the winter season, pursuing the third project theme, 'understandings, practices and values attached to community'. In order to get a sense of what living in the research station entails, he worked as a kitchen helper in the Kings Bay kitchen, and participated in the winter inhabitants' daily life. In the summer 2015, he will return to continue the work with the ornithologists. He will share first results of this pilot after this next field visit.

Social anthropologist Paul Wenzel Geissler. Photo: Seb. Barrault

Restoration of the London-houses

Built in 1912 on Blomstrand, the London houses where moved to Ny-Ålesund in the 1950s, and became homes for the families in Ny-Ålesund. In 2013 and 2014, London 2 has been totally renovated, both inside and outside. The house is one of the more protected in Ny-Ålesund, but now has a good standard. The summer 2015, the house will be used as a station for University of Groningen.

In 2015, London 3 will be renovated to a more modern standard. It will be outfitted with running water and a bathroom. This house will also be used by University of Groningen.

Children playing outside the London-houses in the late 1950s. Photo: Johan Ødegaard.

Nominated for European Award

The Amundsen Villa and the Telegraph has both been renovated in the later years, and are important historical buildings for the Village

The Amundsen Villa. Photo: Åsne Dolve Meyer,

In 2014 they were nominated for the 2015 European Union Prize for Cultural Heritage/Europa Nostra Award for outstanding heritage achievements.

Climate change and reindeer habitat use: GPS-marking of females

By Åshild Ønvik Pedersen, PhD Terrestrial ecologist, Norwegian Polar Institute.

The Svalbard reindeer is endemic to Svalbard, and it is a key species in the tundra ecosystem. The Norwegian Polar Institute has since 1978 monitored the population size of the Svalbard reindeer in Brøgger Peninsula and the surroundings. The monitoring has documented that the population growth rate of the reindeer are negatively impacted by stochastic variation in climate, in particular, the spatial extent of ground-ice blocking grazing grounds. In such years, increased mortality and reduce reproduction are observed. Although several studies from the monitored reindeer population in Svalbard have documented how climate change affect life history of the reindeer, there is limited documentation on the direct impacts of climate warming on reindeer space use. The Svalbard reindeer have small home ranges and is likely vulnerable to local ice-locked pasture due to ground-ice formation after 'rain-on-snow' events. Previous studies have revealed immediate increase in range displacement and changes in habitat use. In such winters the reindeer may be observed foraging at high elevations or along the coast where seaweed and kelp are utilised. The Brøgger Peninsula and surrounding areas are ideal to study the spatial responses of the reindeer to warmer and wetter winter climate because their population dynamics are directly linked to 'rain-on-snow' events and the landscape has numerous barriers (alpine mountains, tide water glaciers and fjords without ice) blocking dispersal of animals.

In 2014 NPI initiated a GPS-telemetry study of female Svalbard reindeer. The GPS-transmitters send geographic position data three times a day, and in this way we collect detailed data on the space use of the reproductive individuals. The main goal of the project is to understand how climate and the interplay between ice on land and sea influence the animals' condition, habitat use and dispersal. In particular research questions like;

(1) *what trigger and what limits the spatial dispersal patterns and ultimately the distribution of reindeer*,
(2) *how do ground ice and lack of fjord ice influences the spatial habitat use of the reindeer* and
(3) *can behavioral adaptations (i.e. use of alternative food sources or high/altitude habitat) mitigate negative effects on forage resources?*

During March-April 2014 the research team marked 21 adult female reindeer (12 on Brøggerhalvøya and 9 on Kaffiøyra) with GPS-collars. The females have a collar numbered from 21 to 41 and yellow earmarks. We also marked 16 female calves and and 4 male calves with collars without GPS-transmitters and earmarks. These animals are marked with the letter «Y» and numbers from 50 to 73. During the annual summer counts in July August 2014 we re-sighted the animals and counted the females with calf on heel. This year was exceptional with no reproduction among the marked females in Brøgger Peninsula, likely related to the record high snow-depths hindering the reindeer to dig foraging craters. In April 2015 additional females and calves will be marked to attain a sample size of around 30 females across the NPI monitoring locations on Brøgger Peninsula, Sarsøyra and Kaffiøyra. Till now, the females have been stationary in fairly small home-ranges. However, the data will be analyzed in detail with proper spatial statistical tools towards the project end in 2016.

Please contact Åshild Ønvik Pedersen aashild.pedersen@npolar.no for web access or information about the marked animals.

The reindeer are caught with a net which is mounted between two snowmobiles, each one of them with an experienced driver and a "netter" on the back. The females are marked with numbered GPS-collars and earmarks, and the calves with plastic collars (without GPS) and earmarks. Photo: Mathilde Le Moullec.

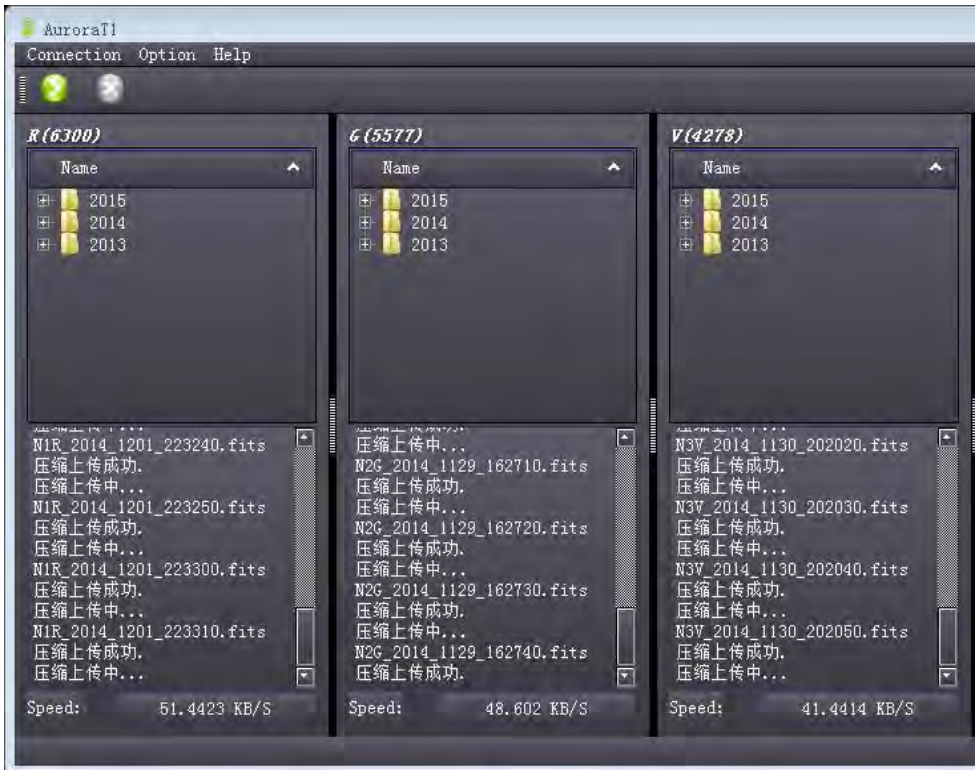
The Svalbard reindeer have small home-ranges and is therefore vulnerable to ice-locked pastures which block forage availability. Such climate impacts affect their spatial distribution and habitat use. Photo: Ronny Aanes.

The project is led by the Norwegian Polar Institute in cooperation with the Norwegian University of Science and Technology, Norwegian University of Life Sciences and Norwegian Institute for Nature Research. The Svalbard Environmental Protection Fund has contributed substantially to the project.

News from the CAA Yellow River Station

By Yang Ley, Yellow River Station

The multi-wavelength aurora all-sky imaging observation is the only project carried out with the operator on-site during the winter season, and the system acquires the three aurora emissions centered on 427.8 nm, 557.7 nm and 630.0 nm simultaneously and continuously with the time resolution of 10 seconds when in the clear and dark sky, without intense moon-light contaminations conditions. The aurora imaging has been implementing every winter since 2003, and has been accumulated huge optic data. Recently a real-time aurora images compressing and transferring with lossless features software has been developed and utilized at the station, with an average transfer speed of 150 KB/s the three wavelengths aurora images can be realized near real-time received on the server in China.



Photos: Dr. He Fang, CAA

Environmental impact of polycyclic aromatic hydrocarbons in the Arctic – a refined perspective

By Maria Granberg, Norwegian Polar Institute.

The intensity of petroleum activities, mining, shipping, and tourism is predicted to increase in the Arctic as the ice cover retracts in response to climate change. This will likely lead to elevated background levels of polycyclic aromatic hydrocarbons (PAH), as well as to an increased risk of oil spill accidents causing acute environmental PAH contamination. In the Norwegian Arctic, PAH concentrations are generally low, but parts of the Svalbard bedrock (southern Spitsbergen and the Brøgger peninsula) contains coal deposits, which have been exploited since the early 1900s. Most of the coal mines are closed today but the PAH contamination foot print is present both on land, in and around abandoned coal mounds, and in coastal sediments.

PAH include and give rise to different groups of compounds, e.g. parent PAH, alkylated PAH homologues and PAH metabolites. Each group contains a plethora of compounds thus posing a vast analytical challenge. Alkylated PAH homologues constitute the main fraction of PAH in crude oil, produced water and natural coal and they occur more frequently than parent PAH in contaminated sediments, waters and oil exposed organisms. Their strong bioaccumulation potential is well established while their ability to biomagnify along marine food chains was only recently observed in nature. Biological effects have also been suggested to be induced by alkylated, rather than parent PAH in organisms from bacteria to sea otters.

Our present knowledge on PAH fate and effects in Arctic ecosystems is limited despite extensive research efforts addressing environmental impact of oil pollution.

Available information is almost exclusively focused on parent PAH (often given as a sum of 16 compounds) and stems mainly from experimental exposures. Consequently, a more refined and realistic approach is required in order to correctly interpret present PAH exposure scenarios and to accurately predict ecosystem impact in a future more industrialized Arctic.

During the summer of 2014 we sampled marine sediments, settling particles, invertebrates, and blood from common eider (*Somateria mollissima*), representative of a short Arctic/sub-Arctic marine food chain, in Tromsø (Grindøya) and Svalbard (Kongsfjorden- along an exposure gradient from the town harbor to the fjord mouth). Concentrations of parent PAH, alkylated PAH homologues and PAH metabolites are now being determined in these samples. Concentrations of individual PAH compounds, from this extended spectrum analysis, will be evaluated in relation to the exposure gradient, organism trophic level and genotoxic response. Our aim is to improve our knowledge on the fate and effects of alkylated PAH and PAH metabolites, including field concentrations, bioaccumulation and biomagnification potentials, and adverse effects, in sub-Arctic and Arctic marine food chains.

Research team: Maria Granberg[1], Geir Wing Gabrielsen[1], Kjetil Sagerup[2], Sveinn Are Hanssen[3], Jasmine Nahrgang[4], Åse Krøkje[5], Jan Christensen[6], Linus Malmquist[6], Marina Vazquez[1,2]

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Research funding: the Fram Centre, Tromsø, Norway.

Preparing sedimentation traps in Kongsfjorden.
Photo: Marina Vazque

Sampling amphipods in Kongsfjorden.
Photo: Maria Granberg

News from the Sverdrup Station

By Christina A. Pedersen, Norwegian Polar Institute

New station leader at Sverdrup Station

Per Erik Hanevold started as new station leader at the Sverdrup Station 1 January 2015.

Topics from the 41st NySMAC meeting

held in Goa, India, 6 - 7 November 2014:

- Environmental work in Ny-Ålesund
- Project status for the new geodetic observatory in Ny-Ålesund
- The Arctic-CARE 2015 campaign in April-May 2015
- Summary from atmospheric flagship workshop in Potsdam and Goa.
- Interact II. Application by NySMAC for observer status.
- Applications/approaches to NySMAC – how to handle them.
- Support of field research on Brøgger-halvøya and north Kongsfjord and protection of the pristine environment.
- Media plan for Ny-Ålesund. To be included in the Ny-Ålesund Charter?
- Presentation on NCAOR's planned glaciological work in Ny-Ålesund
- Status from member institutions
- 42nd NySMAC meeting in Toyama, Japan

The NySMAC participants gathered outside the NCAOR facilities
Photo: Thamban Meloth

Input to Ny-Ålesund Newsletter

If you like to contribute to future editions of this newsletter, please e-mail nysmac@npolar.no. Any ideas or suggestions for topics are also welcomed. *Editor: Ingrid H. Storhaug, NySMAC Secretariat. Next edition: July/August 2015.*

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